Student Perceptions of the Place, Mode, and Teacher Contribution to Teamwork within Undergraduate Chemical Engineering

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Abstract

The challenges of contemporary practice require engineers who can work in multidisciplinary teams comprised of professionals from various backgrounds and disciplines. Graduate engineers are expected to enter the workforce equipped with the ability to work seamlessly with these teams. Thus, it is critical that engineering students develop these skills within and alongside their curricula studies.

However, the literature on students' appreciation for teamwork is equivocal. Students with a positive perception are correlated with collegiality, equitable work distribution, and fair assessment techniques. Common complaints are that that work is unfairly distributed among the team or that their contributions did not receive the recognition they believe it deserved. Further, students point to a lack of guidance on how to develop teamwork skills or they were taught in an ineffective manner. Some students felt they learned less when working in teams and preferred working individually.

Given this context, we sought to understand the attitudes of students within our institution to teamwork. The aim of this study is to understand the factors that contribute to positive or negative perceptions of teamwork. Particularly, how various teaching and assessment practices, prior experience, and team structures impact students' perceptions of teamwork.

We conducted an online, anonymous survey of engineering students predominantly from chemical engineering. The results showed that students strongly agreed with teamwork being a positive experience, but less agreement with propositions for more teamwork and learning better in group contexts. Students desired explicit instruction in teamwork skills and preferred teams with 4-5 members. There were also diverse opinions within the respondents on how work should be distributed within the team and sufficiency of online-only teams. In general, the results indicated that the teacher occupied an educative and mediating role in facilitating teamwork, especially in the current context and prevalence of online and hybrid teams.

We conclude by making recommendations for teachers on the implementation of team-based activities that will provide their students with positive and effective learning experiences for the development of teamwork skills.

Introduction

The practice of chemical engineering has always involved solving problems centred on the efficient use of natural resources, process optimisation and ensuring sustainable operations to meet human ends [1]. Today, the challenges faced are increasingly complex, requiring multidisciplinary collaboration across various fields, including community engagement, medicine, food science, psychology, environmental science, etc. As such, the contemporary and future-ready chemical engineer must be able to work effectively in teams with people of diverse backgrounds, experiences, perspectives, and specialties. This requirement makes strong teamwork skills one of the most sought-after abilities by prospective employers and

clients. This expectation can also be seen in the accreditation conditions of professional bodies like Engineers Australia [2] that require graduate engineers have the capability to lead and participate successfully in teams. Further, the Australian Council of Engineering Deans (ACED) and the US National Academies of Sciences, Engineering and Medicine specify that engineering curriculums should increasingly provide authentic learning opportunities, focusing on replicating situations and environments that mirror the workplace (including collaboration) [1, 3].

At the same time, studies report that students prefer working alone rather than in teams because they believe that work may not be distributed fairly, because they have little control over the final outcome, or because of concerns they may not get along with their teammates [4-6]. In other studies, students have raised issues working in mixed culture teams and have noted impacts on their mental health [7, 8]. In addition, the disruptions caused by the expansion of online learning and pandemic are challenging the traditional approaches to teaching and practicing teamwork.

And yet, good teamwork skills are not only important for the effective completion of work, but also for student wellbeing and maturity. The ability to mediate conflict amicably and to mitigate any fallout post-resolution, is vital when teams consist of individuals of differing viewpoints. Students that collaborate well, are better organised, spend more time on their tasks, build better relationships, and often have higher self-esteem [9]. Teamwork has also been linked with overall academic performance, as well-organized teams tend to lead to students who are more organized with their work.

Thus, teamwork presents a conundrum for teachers: it is a highly desired characteristic by future employers, can have a positive impact on student experience and wellbeing, while also being a source of frustration and stress for students. Given these contrary drivers, we sought to understand the attitudes of students in our institution to teamwork and their preferences for different methods of organising and practicing of team-based activities. The goal of this project is to provide recommendations to teachers on how to design learning activities to develop teamwork skills through positive learning experiences.

Background

There is significant literature on the dynamics of groups and teams, as well as factors affecting the development of teamwork skills in both organisational and educational contexts [10-13]. There has been less attention given to the development of student perceptions of teamwork. However, we can identify a series of factors that can influence student preferences and attitudes.

Teachers and learning design. Education around teamwork is an important contributor to students' attitudes and experiences. Providing students with frameworks for successful team coordination, composition and operation enables them to organise their teams effectively [13]. The development of teams and teamwork skills requires a systematic approach; otherwise apparent collaboration may prove illusory [14]. Teachers also are critical in the overall design of tasks, defining team composition, and helping students commence their work together [10].

Teachers are also important role-models for students developing teamwork and leadership skills, especially for students who have less experience. By emphasising skill and process

rather than technical and academic progress [15], teachers can illustrate the characteristics of successful leaders and teams. Teachers can also use their experience to shape student expectations of how teams will work and improving their confidence to encounter challenges [16]. For example, encouraging a proactive approach to conflict, rather than a fearful or anxious avoidance of conflict [17]. These findings illustrate the continuing need to understand how teachers shape their students' attitudes and readiness for working in teams.

Team structure and dynamics. Student perceptions and preferences for teamwork will be shaped by their past experiences and effectiveness in teamwork. Smith and Imbrie [18] characterize effective teams and teamwork according to the following elements: positive interdependence (sharing a common objective), individual and group accountability (embracing responsibility for the work), encouraging interaction (interpersonal engagement leading to concrete action), teamwork skills (including effective communication, decision making, leadership and conflict resolution), and group processing (reflection that recognises successes and identifies areas for improvement). Conflict resolution also has an impact on increasing student commitment towards the team, as they feel they are more validated by participating and their opinions are being taken into consideration [19]. Skills and structures therefore have a clear impact on the experience of teamwork and are important for teachers to consider in the development of learning activities.

Diversity and inclusion. A further key element emphasized is diversity, in terms of age, educational specialisation, and cultural identities. Studies have shown that tasks and projects which require high cognitive behaviours are positively related to the aforementioned factors [18, 20]. A lack of recognition of differing student temperaments may lead to introverted students feeling unheard, disengaging them from the group, and being perceived as loafers. On the other hand, more extroverted students may dominate interactions, leading to unfair delegation or inflated perceptions of their contributions. The benefits of diversity are linked to bringing varied perspectives that can facilitate creative and innovative outcomes for the team [21].

While some studies have shown that shared learning leads to students being more inclusive in evaluating the contributions of one another and reducing conflict [22], others indicate more mixed outcomes [7]. Hiley, et al. [8] investigated the experiences of international students in the UK from both the EU and further afield. They found that while international students experience a series of issues common to both international and domestic students, their experience was compounded by specific challenges related to communication styles and cultural/linguistic barriers. Straker [23] cautions against reductionist approaches that focus purely on English language deficits in international students. The pandemic has also impacted the participation of many international students (e.g., at Australian universities), as they were restricted to online learning and teamwork through border and campus closures [24]. Thus, it is important to continue exploring the differing experiences and perspectives of international and domestic students when considering using team-based activities.

Assessment. Burdett [5] found that students develop a more positive outlook on teamwork when they perceive that workload and assessment were carried out fairly. The students were more inclined to feel that teamwork had led to a better outcome compared to working individually. Peer evaluations are an important way of giving agency to students to offer feedback to each other throughout the life of a project. However, it can be hard to abstract individual contributions to team progress in project-based learning. The more complex the project, the more functions the team performs, resulting in overlapping roles and

responsibilities [25]. A key factor here is allowing sufficient time between assessments for feedback to be implemented, allowing members the chance to revise their strategies [16]. Some of these challenges can be addressed through the use of templates, such as IDEALS [26], that provides a comprehensive assessment schema for team activities. The involvement of facilitators and teachers also needs to be considered, particularly the amount of intervention needed. Thus, assessment remains a critical factor in shaping student perceptions of teamwork and teachers can make significant contributions to positive attitudes through careful design.

Digitalisation and hybridisation. Within this context, the increasing digitalisation of the university experience has allowed students and teachers to interact in new modes other than traditional classroom settings. This has also given rise to virtual (or online) teamwork and raised questions about the relative efficacy of virtual and face-to-face teams. The benefits of online teamwork include flexibility and cost-effectiveness – particularly through lower requirements for physical infrastructure [27]. Online teams can also exploit a differences in time zone and location to enable diverse teams to function more effectively [28]. Furthermore, online teamwork may discourage biases related to ethnolinguistic characteristics, allowing teams to be formed based on skill regardless of geographical and ethnic boundaries, promoting inclusion. This promotes an environment where performance management is based on productivity of the individual and team [27]. However, the lack of face-to-face interaction can result in higher amounts of miscommunication in online teams.

Brewer [29] found a range of factors that can contribute to miscommunication in virtual teams. These factors included (1) textual factors like language comprehension and connotation, as well as implicit assumptions and deficits in information sharing; (2) contextual factors like cultural awareness and expectations, time zones; (3) tonal factors such as body language, directness of speech, and netiquette. In fact, the lack of face-to-face communication in virtual teams can also mean causes of miscommunication can go undiagnosed impairing team effectiveness. Within this complex context it becomes critical to understand student attitudes and preferences around teamwork particularly as the use of online and hybrid learning expands.

Method

Since the purpose of this study is to understand student perceptions and preferences in team-based activities, we structured our investigation around the key factors seen in the literature using the following categories:
- *Past experiences of teamwork*, including composition, online teamwork, ways of working, leadership styles, and assessment methods.
- *General perceptions of teamwork*, including whether it was a positive experience, whether it should be used more often, and its importance for professional practice.
- *Team structure and dynamics*, including preferences for different size groups, numbers of leaders and how work is distributed.
- *Online teamwork*, including student preferences and their perception of the effectiveness of online teamwork.
- *Teacher's role*, including how teams are organised and facilitated, the level of intervention, and how team contributions are assessed.

Several research methods were considered to investigate student perceptions of teamwork, including surveys, focus groups, and interviews. Survey was selected as the primary tool due

to the opportunity to garner mass responses from students, and the ease of outreach. Development of the survey was carried out by implementation of the following steps:

1. *Selection Criteria:* Based on the Key Assessment Parameters and the hypotheses to be tested, the selection criteria for the questions to be included were set, allowing a tighter focus on the development of the research plan.
2. *Question Generation:* Brainstorming and researching existing surveys were used to develop a pool of closed questions for the survey. These were revised and edited to trim the questions to a manageable amount, with target duration of fewer than 5 minutes. For the second phase of the project, subjective questions were added after each section.
3. *Survey Development:* The survey was built on Google Surveys, using the question bank created. The format of the questions was tailored according to the level of specificity that was needed. The survey was reviewed and approved by our institution's human research ethics committee.
4. *Validation:* The final survey was reviewed internally and then tested with a sample audience of 3 students. Feedback collected from the test audience was reviewed, analysed, and used to revise the survey.
5. *Rollout:* The survey was initially taken by a third-year chemical engineering class and initial results collected. Reflection on the results of this initial run allowed us to further optimise the survey to have an even tighter focus on our hypotheses. Course coordinators from within our department, the Faculty of Engineering and other faculties were contacted about running the survey in their courses. The survey was subsequently promoted to additional courses. The general population makeup of the respondents can be seen in Figure 1.
6. *Result Analysis:* The collected results were analysed, observations noted, and hypotheses tested. For Likert-scale questions, analysis was done by giving the responses (Strongly Disagree, Disagree, Moderately Disagree, Moderately Agree, Agree, Strongly Agree) numerical values from 1 to 6 respectively, and calculating the mean and standard deviation for some sections. For other sections (Online vs In-Person Teams, Student Roles and Characteristics, Peer Evaluation, and Teacher Roles) the skew of the data was plotted, along with graphs that show the distribution of the data. Aside from that, percentage agreement was also tallied, to provide an overview of the population that agreed with the respective questions.

Results and Discussion

The respondents are all students from the University of New South Wales, a large Australian research-intensive university. Most respondents were from third year and fourth-year engineering classes; thus, the data mainly reflects the views of those students. The total number of respondent (n_T) is 84, with respondents from undergraduate 1st year ($n_1=18$), 2nd year ($n_2=6$), 3rd year ($n_3=33$), 4th year ($n_4=20$), 5th year ($n_5=9$), postgraduate 1st year ($n_{p1}=4$), and 2nd year ($n_{p2}=3$). The demographic distribution according to discipline is as shown below in Figure 1.
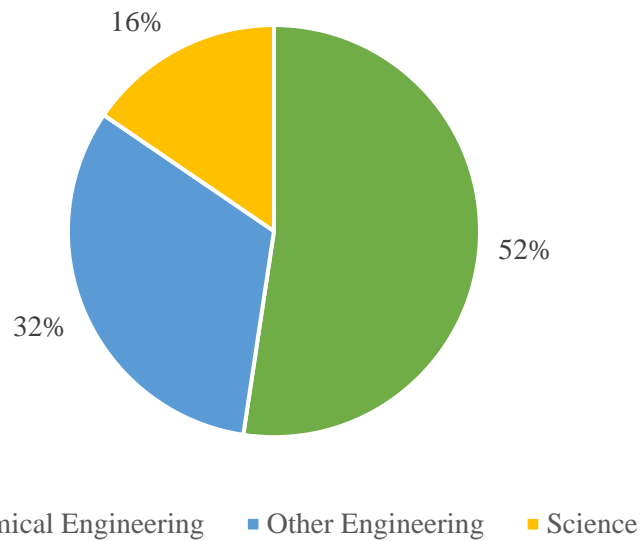
Figure 1 – Distribution of respondent's discipline of study

Investigations carried out by Marks and O'Connor [9] paralleled a few of our survey questions allowing us comparison between our findings. However, since there were differences in scales and question types, this comparison is only performed at a qualitative level.

Current perceptions of teamwork. One of the focal points of the research was to determine the respondents' current perceptions of teamwork. 93% of the population agreed that teamwork was a positive experience (Mean=4.58), while a smaller majority of 73% felt that it should be used more in classes (Mean=4.13). This could indicate that students feel there is already enough teamwork in the curriculum or could indicate that its implementation needs improvement.

Respondents were asked on a binary scale to indicate whether they felt that they learned better in a group or individually, with 67% of respondents agreeing that they learned better while working in a group. This sentiment follows theory on how communities that are formed around shared practices and learning, encourage productivity and foster enthusiasm within the community [30]. Whereas Marks and O'Connor used a 5-point scale with this question and found that responses lay between mild agreement and neutral, showing a mild preference for learning in teams. This probably implies that there could be more effort on framing how teamwork enhances learning and emphasising the motivations for including teamwork as part of a particular course.

A large majority of respondents show an appetite to develop better teamwork skills with 98% of respondents (Mean=5.11) agreeing effective teamwork skills should be taught explicitly within courses, and that networking (Mean=5.08) and conflict resolution (Mean= 5.15) skills are learned through teamwork.

Respondents also shared their negative experiences faced in teams. Most respondents (63%) had experienced an unfair distribution of teamwork. While with respect to the (in)activity of leadership in teams, approximately equal numbers had experiences of dominant and hesitant leadership. Here, 48% had more often experienced teams with one individual dominating the team, whereas 52% experienced teams where no one wanted to lead.

From subjective question data, 12 respondents noted that they understood how to contribute to a team as a member, highlighting the value of multiple perspectives in collaborative problem-solving, and the need for all members to participate and initiate discussion, typified by the following comment:

"Working in a team is really useful in terms of getting multiple perspectives on one concept to understand different people and their thought process ..."

Team structure and dynamics. Respondents were questioned on preferred teamwork aspects such as their preferred number of members within a team, medium of teamwork, and teacher involvement. Based on prior experiences respondents have had (see Table 1), we also investigated membership size within a team. Respondents who had worked in teams of 5 people or less, tended to favour teams of 4-5 members, with a slightly lower preference for teams of 2-3 members. Respondents who had worked in larger groups, with more than 5 people, had a higher percentage preference for teams of 4-5 members as well. Both sets of respondents did not favour groups with more than 6 members (see Figure 2). The preference for smaller but not too small teams indicates that team management is easier when group numbers are manageable. This is most likely attributed to the notion that smaller groups allow for better communication and decrease the risk of conflicting perspectives and social loafing, common in larger groups.

As noted earlier, international students can face compounded challenges in engaging with group work. Therefore, it is important to explore whether residential status impacts student preferences. In this study, we found few areas of noticeable difference between international and domestic students. One area where we did observe a difference was in relation to preferred group size. While domestic students had a clear preference for teams with 4-5 members (63%), international students were more diverse with both higher preferences for smaller (2-3 member) and larger (6-7 member) teams than their domestic peers. Further investigation is required here as previous research on Australian students, shows that international students prefer smaller teams, as they are perceived to reduce communication challenges and the need to clarify responsibilities.

Table 1 – Preferred Team Size according to Prior Experience

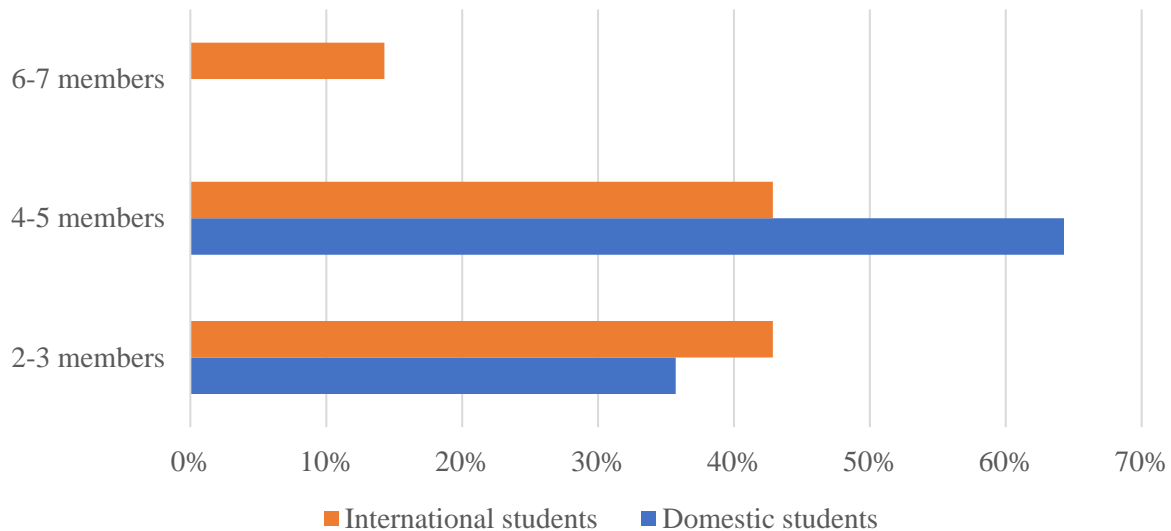| Preferred Team Size	Worked in Teams of 5 or less	Worked in Teams of 5 or more
2-3 Members	42%	32%
4-5 Members	52%	62%
6 or more Members	6%	6%

Figure 2 – Team size preferences according to residential status

Another aspect investigated was the preferred method of deciding delegation priorities within a team according to 3 parameters: Equal share of work, technical knowledge of each member, or based on the work ethic of each member. The results shows that 44% of respondents prefer an equal distribution of work and 41% preferring work be distributed according to technical knowledge. This was the other areas where we observed a clear difference between domestic and international students. Figure 3 shows that domestic students favour work to be distributed equally among all team members, whereas international students feel that technical knowledge should be the driving factor behind work distribution. This may reflect differing emphases on process versus outcome, with domestic student favouring the former and internationals students the later. However, this can lead to disparity in the expectations placed on group members. One international student also espouses the same sentiment:

"Depends on the competency of the group members – if they are similar, the work is spread evenly otherwise it tends to be heavily skewed."

Online teams. Most respondents (90%) have worked in predominantly online teams before. Online teams were studied previously, and we found that most respondents prefer working face-to-face rather than online, in teams. Further research has shown that most students (88%) still prefer working in in-person teams compared to online teams (Mean=4.87). Online teams were said not to be entirely effective for communication (Mean=3.23) or conflict resolution (Mean=3.11). 53% of respondents felt that online teams were not suitable for getting to know their team sufficiently. Proper interaction with team members is better facilitated when team members are comfortable communicating with one another, which stems from repeated interaction within a welcoming environment. Psychological barriers that arise from the artificiality of online teamwork paired with the difficulty students can face with communication [29], increase the chance for miscommunication, leading to low achievement rates within the team [31].
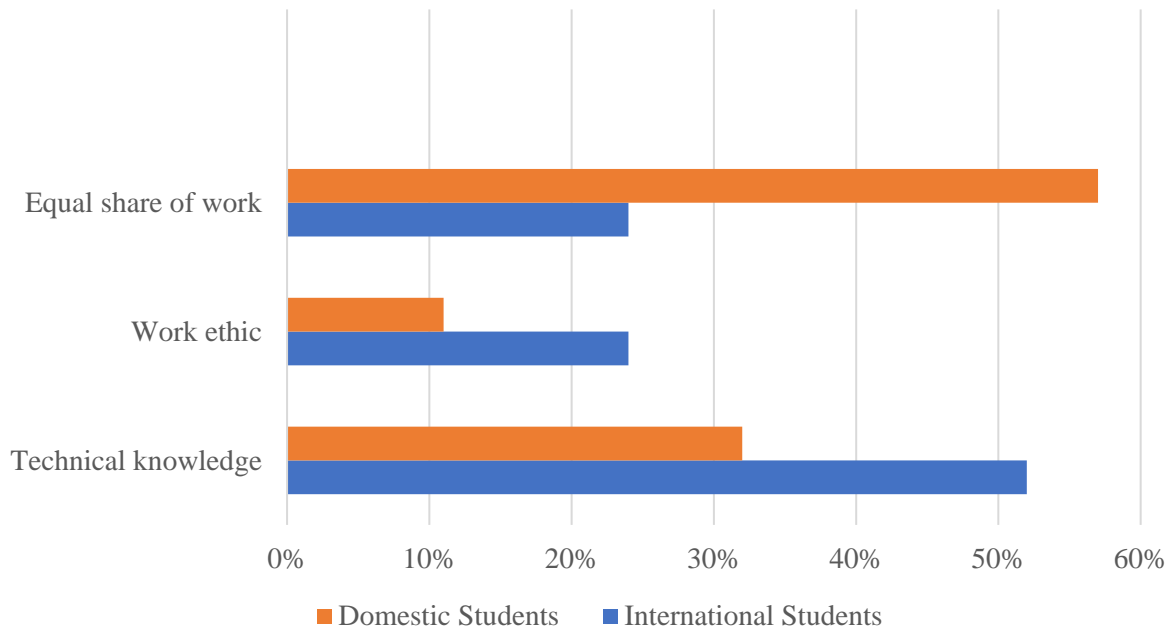
Figure 3 – Task distribution preferences according to residential status

Analyzing the effect among different undergraduate cohorts and their responses to online teamwork led to several significant findings. Year 2 responses were not included due to the number of responses not being statistically viable, compared to that of the other cohorts. As shown in Figure 4, the percentage of respondents that favored in-person teamwork increased between Year 1, Year 3, and Year 4. Social loafing was said to be highly prevalent in online teams, with 83% of respondents agreeing so. The perception of social loafing within online teams was the highest among respondents from Year 3, and the lowest among respondents from Year 1. This can be attributed to the fact that Year 1 students have significantly less teamwork experience than Year 3 students, who have ideally undertaken courses that require more efficient teamwork. Year 3 students also tackle more complex problems than Year 1 students, requiring equally complex problem-solving approaches, which can be significantly hampered by communication issues and conflicts, established to be harder to resolve in online teams.

This was the third area where we found differences in the responses of international and domestic students. We found 57% of international students said they felt that online teams were sufficient for them to get to know their team members, as opposed to only 39% of domestic students. Furthermore, while most of both groups do prefer working face-to-face with their teams, a higher percentage of international students (29%) preferred online teams – only 11% of domestic students preferred online teams. This may be because international students were more strongly impacted by the post-pandemic shift to online classes and teamwork and developed a greater affinity for online teams. In fact, online teams may have been the only respite for them from the isolation of remote learning. Online teams may also moderate anxieties related to integrating team members from diverse backgrounds.
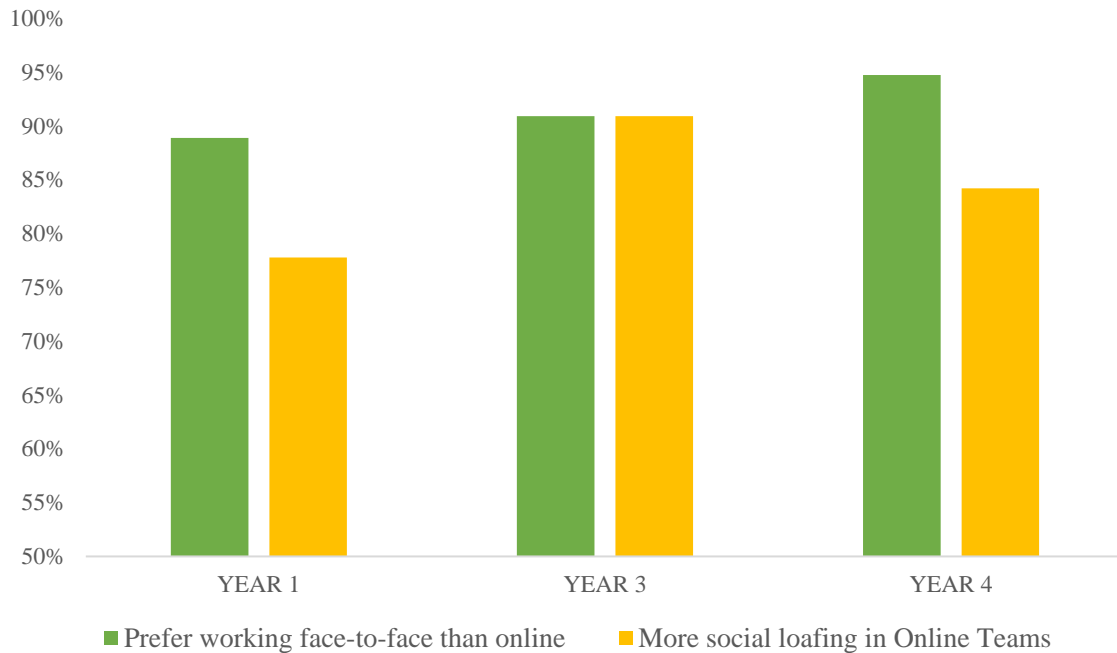
Figure 4 – Online Team Perception and Preference by Cohort

Subjective question data regarding better implementation of online teams, identified common contributors to the low reception of online teamwork, with most respondents desiring the mandatory usage of cameras and microphones, raising concerns around teams where some members communicate solely through text. This phenomenon encourages perceptions of non-participation by the team member in question. Some respondents also raised concerns about accountability in online teamwork:

"… online meetings are only good when the team works efficiently individually and compile their results together."

"… using tracking software on a designated platform to track the work done…, making a person's individual statistics compared to group averages visible to them alone."

Possible abdication of responsibilities seems to be a cause for concern among students. Further concerns about online teamwork also brought up related issues of measuring progress and establishing accountability within the team, as these factors can seem nebulous in online teams.

Online teams do have significant positive qualities that were pointed out, with 60% of respondents agreeing that online team meetings are more structured than in-person meetings. This suggests that due to the nature of the online medium, which functions as a base for collaboration, efforts towards conducting meetings are more directed. In addition to that, online teams were also said to accommodate progress checks by teachers with almost 70% of respondents believing that teachers will be more up to date with online teams rather than in-person teams. 63% of respondents do prefer working online compared to working individually, which implies that a hybrid model, a combination of online and in-person teamwork could be considered as an alternative.

The teacher role in teamwork. We have previously found [32] that teachers play a significant role in facilitating teamwork. However, the role of the teacher appears to be more mediating than authoritative, following theory posited by Crosthwaite [33] on lateral development of teacher responsibilities, as respondents tended to favour options that would allow students more freedom in developing their teams (see Table 2).

Table 2 – Preferences for Teacher-Facilitated Teamwork

Questions	Mean	Standard Deviation
Lecturers should only involve themselves in team meetings to mediate conflict	4.05	1.23
Lecturers should allow students to pick their own teams for projects	4.50	1.05
Lecturers should allow time in-class for teams to have short meetings	4.90	0.85
Lecturers should use the results of peer evaluation to determine a team member's grades	4.35	1.04
Lecturers should decide which student becomes the team leader	3.00	1.59
Lecturers should only discuss conflict with the team leaders	2.85	1.73
Lecturers should place academically stronger students in teams with academically weaker students	3.25	1.55

For example, respondents preferred exercising the ability to pick their own team members (75% agreement) and that the teacher should not pick the team leader (60% agreement). We found that students preferred a high level of agency in selecting their teams and team leaders (if any). Marks and O'Connor [9] also investigated preferences of students for selecting their own teams and found that the responses lay between strong to mild agreement, suggesting students feel they work better if the team composition is determined by the students themselves. This presents a challenge for teacher preferences to create balanced and diverse teams.

Furthermore, there was only slight disagreement (45% agreement) that teachers should structure teams according to their academic performance, placing lower-performing students with higher-performing students. Again Marks & O'Connor also found their respondents were neutral about grouping students by their academic ability. This suggests an uncertainty of the consequences of this strategy, in terms of teacher attention and facilitation, project progress, and marking criteria, to name a few. Further testing would be required if this framework is considered for determining team composition.

The belief that the high-achieving students will be forced to carry low achieving students could also lead to the disparity. However, theories on group learning [34, 35] suggest that technical skill should not be the only qualification, and that the group context enhances

learning – ideal for lower-performing students. Slavin [36] states that while there may be academic disparity among students in the same group, mixed ability learning has not shown to favour low achievers more than high achievers, as both groups have the same amount of relative gains from teamwork.

In-person team meetings during class time were also highly favoured among respondents, as all respondents agree that teachers should accommodate team meetings alongside dissemination of course content. On the topic of mediation, teacher intervention was preferred only when teams face conflict (75% agreement), but respondents disagreed (35% agreement) that conflict should only be discussed with team leaders. This insinuates that teacher intervention is highly required as conflict resolution can be nuanced, and an unbiased perspective is required. This also emphasizes the willingness of students to participate in resolution, highlighting the need for conflict resolution methods to be taught to students.

Thematic analysis of subjective question data revolving around how teachers can better facilitate teamwork, highlighted respondents' desire for a level of structure, as most respondents mentioned needing templates for organizing meetings, setting expectations for progress, and clearly outlining the task and its deliverables. Prior research has mentioned that setting clear expectations for teams and team members, leads to better assessment of a team's capabilities and progress [16]. Thus, the teacher shoulders the responsibility by making sure preliminary measures are in place for students to prepare themselves for teamwork, without heading straight into teamwork.

Conclusions and recommendations

We surveyed a total of 84 students across various disciplines and cohorts, and of different residential status. In contrast to the popular imagination and some studies, we found that students held highly positive views of teamwork in general and its importance for professional practice. However, the current academic implementation of teamwork is not as favourable. These opinions are similar across year levels; however, larger sample sizes may be required to develop a better understanding. This indicates that the value of teamwork is being successfully communicated to students in our program, but their experience is impacted by learning design.

We found in-class team meetings under the guidance of the teacher were highly favoured, showing that students are willing to learn the necessary skills for efficient teamwork. Teachers were also deemed pivotal to conflict resolution, with students asking for more liberty in selecting teams and team leaders. The disparity between international and domestic students in deciding task delegation, further emphasizes the need for teacher guidance on how to reach a consensus among team members of differing backgrounds.
The students did not prefer online teams over in-person teams, pointing to poor communication and higher perceptions of social loafing. We did find that international students were more in favour of online teams, compared to domestic students, perhaps arising from differing experiences of pandemic. Students reported the implementation of online teams afforded teams more organization and structure to team meetings that were lacking in in-person team meetings.

Therefore, we recommend the careful preparation of students for team-based activities and ongoing support by teachers of teams. This preparation can include teaching organisational and communication strategies and facilitating role playing conflict resolution scenarios.

Group sizes should be chosen prudently, considering students' competencies and experience in working with different team sizes, with groups of 4-5 students being the default option. Teachers should also provide instructions for teams to negotiate goals, work distribution and accountability with clear methods for assessing each team member's contributions to the completion of the project. Finally, online and hybrid teams should be carefully structured – teachers should ensure that teams reach consensus on communication and accountability methods.

Additionally, further investigation is necessary to gain the perspectives of a broader sample of students. Garnering responses from respondents across more academic levels and different fields of engineering would help build a more comprehensive picture on current teamwork practices. This work can also further clarify the effect of other demographic factors on perceptions of teamwork (including gender and socioeconomic status). Furthermore, teacher perspectives could also serve to develop a better understanding of the practice, purpose, and effectiveness of team-based activities.

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